

### **REMARKS/ARGUMENTS**

This Reply is in response to the Office Action dated August 28, 2006 and is accompanied by a petition for a two-month extension of time along with an authorization to charge the required statutory fee for the extension.

In the present Office Action, Claims 1-3, 5, 6, 9, 10, 19-23, 31-34, 36-37 and 73-74, which are all drawn to a chemical mechanical polishing (CMP) slurry were pending. Most claims were rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 6,309,560 to Garg in view of U.S. Patent No. 5,055,019 to Meyer et al. and further in view of U.S. Patent No. 6,309,560 to newly cited Kaufman, with the rejection of several dependent claims based on additional references.

In this Reply, claims 1, 23, 24 and 73 have been amended, claims 5 and 9 have been cancelled, and claims 75 & 76 have been added. Claims 1 & 73 have been amended to incorporate the particle size limitation previously found in claim 9, which has been cancelled. Claim 23 has been amended to correct misspellings noted by the Examiner. Claim 24 has been amended to correct an antecedent basis problem. New claims 75 & 76 recite the slurries of claims 1 & 73, respectively, "wherein said nanoporous comprising particles comprise at least one material selected from the group consisting of silica, zirconia, yttria, titania, silicon nitride, silicon carbide." This list draws support from original claim 2. No new matter has been added.

Applicants respectfully request that the Examiner contact the undersigned counsel at 561-671-3624 to schedule a telephonic interview prior to issuing the next Office Communication. Applicants unsuccessfully attempted to arrange an interview between late December and early-January. Applicants firmly believe such a teleconference will expedite prosecution of this application to allowance.

All claims were rejected despite Applicants' Reply filed on June 13, 2006 which included arguments why the cited Garg and Meyer references, which have nothing to do with CMP, (i) fail to disclose or suggest the claimed "at least one additive selected from the group consisting of an oxidizer, a selective adsorption additive, and a salt", such additives being particular to a CMP slurry, and, (ii) provide no legally sufficient motivation to combine the cited Garg and Myer references. In the Response to Arguments section of the present Office Action (copied below) the Examiner dismissed Applicants' arguments filed on June 13, 2006 by identifying a new ground of rejection, the newly cited Kaufman reference. Kaufman is used in an attempt to make up for the admitted deficiencies of Garg and Meyer regarding the claimed "at least one additive ... " element of claims 1 & 73.

#### ***Response to Arguments***

7. Applicant's arguments with respect to claims 1-6, 8-10, 17, 20-26, 29, 30, 32-35, 37, and 72-73 have been considered but are moot in view of the new ground(s) of rejection because the formerly applied references failed to address "A slurry for chemical mechanical polishing (CMP), . . . -including at least one additive selected from the group consisting of an oxidizer, . . . and a salt-. . ." in (Currently amended) Claim 1 and the limitations in (New) Claims 72-74.

As will be describe in detail below, at best the new ground of rejection based on Kauffman provides the claimed "at least one additive selected from the group consisting of an oxidizer, a selective adsorption additive, and a salt." However, Kaufman does not in any way address Applicants' evidence and arguments provided with the Reply filed on June 13, 2006 (ii)

why there is no legally sufficient motivation to combine the cited principal references, Garg and Meyer. Moreover, Applicants will clarify (ii) why there is no legally sufficient motivation to combine the cited the principal Garg and Meyer references, and also demonstrate why there is no motivation to combine Kaufman with Garg in view of Meyer.

According to the Examiner:

**Garg teaches nano-sized powder of alpha alumina having silica coating thereon (column 5, lines 7-10). Garg further teaches a polishing slurry is comprised of a alumina powder has a silica coating wherein 95% of the particles have widths of from 20 to about 50 nanometers while less than 5% have particle sizes greater than 100 nanometers and is dispersed in a liquid dispersion medium (claims 6 and 9). The aforementioned reads on,**

**A slurry for chemical mechanical polishing (CMP), comprising:**

**a bulk solution; and**

**a plurality of particles, In claim 1; and**

**encompasses an average particle size of said nanosize comprising particles is less than 500 nm, in claim 9 and is from 200 to 500 nm, In claim 10.**

**Garg differs in failing to teach a plurality of nanoporous comprising particles, in claims 1, 5, 6, 9 and 73.**

**Meyer discloses boehmitic alumina compounds having  $Al_2O_3$  and the compounds have pore radii in the range of 3 to 100 nm (Abstract and column 1, lines 6-10), which reads on a plurality of nanoporous comprising particles.**

Since Meyer illustrates a plurality of nanoporous comprises particles is known, then it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Garg's slurry by employing compounds having a pore radii in the nm range as taught by Meyer, including applicants' specifically claimed range because such compounds can be used in polishing agents (Meyer, column 1, lines 11-16).

Garg in view of Meyer differ in failing to teach at least one additive selected for the group consisting of an oxidizer, a selective adsorption additive, and a salt, in claim 1;

wherein said additive comprises said selective adsorption additive, in claim 2;

at least one passivating additive, in claim 19;

at least one complexing agent, as specified in claims 20-21;

wherein said selective adsorption additive comprises a mixture of at least one anionic surfactant and at least one cationic or zwitterionic surfactant, in claim 22;

Kaufman teaches a chemical mechanical polishing slurry (CMP slurry) that comprises an oxidizer, an abrasive, a complexing agent, a film forming agent (same as Applicants' passivating additive) and other optional ingredients (column 2, lines 24-28). Well known polishing slurry additives may be incorporated into a cmp slurry. Optional and useful additives include salts (column 6, line 63 - column 7, line 5); anionic, cationic, nonionic, or amphoteric surfactant, which preferably include dodecyl sulfate sodium salt, sodium lauryl sulfate, dodecylsulfate ammonium salt, and mixtures thereof (column 7, lines 8-42). Kaufman also teaches the slurry is maintained at pH within a range of 2.0 to about 12.0 (column 9, lines 1-5).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Garg in view of Meyer by employing an oxidizer, and additives such as salts and surfactants, as taught by Kaufman for the purpose of respectively aiding in oxidizing and polishing metals (Kaufman, column 5, lines 39-51), improving or enhancing the polishing rate of barrier layers in the wafers (Kaufman, column 6, line 65 -column 7, line 2), and reducing the within-wafer-in-uniformity of the wafers, thereby improving the surface of the wafer and reducing wafer defects (Kaufman, column 7, lines 15-19).

Applicants respectfully disagree with the assertion of obviousness based on Garg in view of Meyer, as well as Garg in view of Meyer in view of Kaufman. However, before reviewing the cited art, Applicants will review the claimed invention as now recited in amended claim 1 (copied below-having amendment shown).

1. (Currently amended) A slurry for chemical mechanical polishing (CMP), comprising:  
a bulk solution including at least one additive selected from the group consisting of an oxidizer, a selective adsorption additive, and a salt, and;

a plurality of nanoporous comprising particles, wherein an average particle size of said nanoporous comprising particles is less than 500 nm.

Amended claim 1 thus recites a CMP slurry, comprising a bulk solution including at least one CMP specific additive (oxidizer, a selective adsorption additive, or salt), and a plurality of nanoporous and nanosize particles, wherein an average particle size of the particles is less than 500 nm.

Surprisingly, the inclusion of nanopores in the nanosized particles creates a slurry that results in reduced surface defectivity, *i.e.* fewer scratches, than possible using slurries known in the art. It is believed that result is achieved because the nanopores (i) increase stability of the particles in the slurry & (ii) reduce agglomeration between the nanoparticles. None of these benefits are disclosed or suggested by any combination of the cited art.

Nanoparticles slurries are not generally stable because the nanoparticles are typically much more dense than the slurry carrier fluid (for instance, alpha alumina has a density 4 times that of water). Thus, nanoparticles tend to rapidly settle out of conventional CMP slurries. The claimed slurries exhibit significantly reduced settling. The reduced settling is believed to result because the nanopores (a) increase the surface area of the nanoparticles thereby increasing repulsive forces between the nanoparticles, (b) cause the inclusion of air and water in the nanoparticles, which reduces the Van der Waals attractive forces between the particles, and (c) decrease the density of the particles. Whatever the source, the surprisingly stable slurries of the claimed invention contribute to the surprising uniformity of the polished surface.

Reduced agglomeration of particles also contributes to the improved uniformity of the polished surface. It is believed that both agglomeration and settling of the particles cause scratches in the surface being polished. Since the nanopores surprisingly reduce settling and

increase the repulsive forces between the particles (*i.e.* reduce agglomeration), the claimed slurry provides significantly reduced defectivity (improved uniformity) of the polished surface compared to the state of the art. Each of these aspects of the claimed invention are neither disclosed or suggested by the cited references.

As noted in Applicants' reply filed on June 13, 2006, CMP processing which is the focus of Kaufman (and the claimed invention) is very different from both chemical etching and mechanical polishing disclosed by Garg and allegedly by Meyer. The distinction is explained in the article below that was published in the October 2002 edition of MRS Bulletin (full copy attached was attached with Reply file June 13, 2006, with salient details copied below):

The CMP process is often confused with chemical etching, and/or mechanical polishing process. All the three processes achieve controlled material removal; however the mechanisms by which material removal is achieved are completely different. In a chemical etching process, material removal is achieved by a chemical reaction at the surface, resulting in the formation of dissolved species and subsequent transportation of the dissolved species from the surface. The etching rate/removal rate is constant and does not change with time. This is shown schematically in Fig. 3. In the CMP process, the chemical reactions between the chemicals and the metallic layers result in a thin, non-dissolving and chemically passivating surface film which is subsequently removed by the mechanical action of the particles. Initially the chemical reaction rate is high, but due to passivation effects, the reaction rate drops immediately. When the surface layer is removed by abrasive particles in the slurry, the surface film formation and passivation phenomenon repeats itself (Fig. 3). Thus, static etch rate in a CMP process is quite low. In dielectric CMP, although surface passivation is not a critical issue, the formation of a soft hydrated gel-like layer on the surface is important to achieve high performance polishing.

In mechanical polishing, the removal of material takes place by direct interaction of particles on the original surface. The material removal in this case can be considered to be due to the classical abrasion wear mechanism which involves indentation and the removal of material by a scratching process. This material removal mechanism typically requires high energy because bonds have to be broken by mechanical forces only. Due to large energy requirements, the removal rates are typically much lower than CMP unless larger sized particles are used, in which case high surface defectivity is obtained. Thus, an inverse relationship typically exists between the rate of removal and the surface finish. In contrast, in a CMP process, the chemical modified surface layer is much easily removed because of its inherent nature: soft, ductile layer in the case of silica and more brittle layers in the case of metals such as tungsten, copper, etc. Figure 5 shows schematically the relationship between removal rate and surface finish for all three

material removal processes.

Garg is entitled "Nano-sized alpha alumina particles having a silica coating thereon" and discloses nano-sized powders of alpha alumina can be obtained from a boehmite gel doped with a barrier-forming material such as silica that is then dried, fired and comminuted to powder form. Read in context, Garg is a ceramics patent that mentions polishing in passing without any mention of semi-conductors. Thus, Garg should be recognized as nonanalogous art. The only mention in Garg regarding porosity is in the background regarding the "porous nature of the boehmite particles" as copied below:

One of the problems in working with a boehmite gel to produce formed ceramic articles is that the gel cannot exceed about 65 wt % solids because of the *porous* nature of the boehmite particles. Thus there is a lot of water that needs to be driven off in the course of the drying process. In addition not only is there further shrinkage as a result of the elimination of the water associated with the boehmite, (which is of course alpha alumina monohydrate), but the phase change from the intermediate gamma phase (to which the boehmite first converts) to the final alpha phase also involves a shrinkage. Thus the direct fabrication of a ceramic product from boehmite is only practical for thin objects where the water loss can be relatively easily be accommodated and the shrinkages can be controlled.

See Garg, col. 2, ln. 40-53.

In one embodiment, Garg discloses a polishing slurry comprising a powder dispersed in a liquid dispersion medium (claims 9 and 10). However, Garg does not mention CMP and does not disclose or suggest Applicants' claimed CMP slurry including the claimed "nanoporous comprising particles" or the recited "additive selected from the group consisting of an oxidizer, a selective adsorption additive and a salt." CMP is a very specialized category of polishing that would not have even registered by one skilled in ceramic manufacturing.

Meyer is entitled "Process for the production of boehmitic aluminas" and discloses a process for the preparation of boehmitic alumina compounds having a purity of, at least, 99.95%  $Al_2O_3$ . The compounds produced according to the invention have a pore radii in the range of 3 to

100 nm. The preparation of such compounds is carried out by, first, obtaining an alumina suspension from a neutral aluminum alkoxide hydrolysis and, then, aging the alumina suspension in an autoclave, preferably, at a steam pressure of 1 to 30 bar, corresponding to a temperature of 100 degree C. to 235 degree. C., for between 0.5 and 20 hours. The aging step of the invention is preferably carried out with stirring at a peripheral speed of 1 to 6 m/s.

As noted above, the Office Action combined Garg and Meyer using the following rationale:

**Since Meyer illustrates a plurality of nanoporous comprises particles is known, then it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Garg's slurry by employing compounds having a pore radii in the nm range as taught by Meyer, including applicants' specifically claimed range because such compounds can be used in polishing agents (Meyer, column 1, lines 11-16).**

Applicants acknowledge that Meyer mentions in a single place in its Background (cited by the Examiner) that the nanoporous particles according to Meyer can be used for "polishing". Applicants have copied the full paragraph below relied on by the Examiner.

*In the neutral hydrolysis of aluminum alkoxides, e.g., as described in DE-AS 1 258 854, aluminas with a boehmite structure or .alpha.-aluminum oxide monohydrate are obtained. The products obtained have a maximum pore radius of 2 to 4 nm and can be used as pigments, fillers, polishing agents and catalyst carriers. However, it is particularly desirable, in the case of carrier materials for catalysts and for separating gaseous components, that such aluminas are obtained with a pore volume or with pore radii in a specific range. It is particularly desirable to increase the pore volume of such aluminas and also to increase the pore radius, while maintaining a very narrow pore radius distribution.*

Significantly, Meyer discloses his invention is "particularly desirable, in the case of carrier materials for catalysts and for separating gaseous components". Applicants note that in the case of catalysis, more surface area is clearly desirable as it increases surface area for the reaction to take place. In contrast, prior to the claimed invention, there was no apparent advantage in using porous particles for polishing (as compared to conventional solid particles). Significantly, particle porosity is well known by those having ordinary skill in the art to reduce the mechanical integrity of the particles. For example, one having ordinary skill in the art of mechanical polishing, or even CMP, would readily appreciate that porosity of any kind would mechanically weaken the particles and make the particles susceptible to fracture or even pulverization during mechanical polishing. The resulting fracture or pulverization would result in a reduced polishing rate. Thus, since mechanical integrity is a known problem regarding porous particles and no advantages regarding porous particles are disclosed or known to those having ordinary skill in the art, the cited art and knowledge in the art clearly teach away from including nanoporous particles to the mechanical polishing slurry disclosed by Garg. This is clear from the fact the Examiner has not cited a single true polishing reference, much less a CMP reference, that teaches nanoporous nanoparticles.

Moreover, Applicants can find no suggestion or motivation to modify Garg to add the nanoporosity disclosed in Meyer nor in any of the references of record in this case. MPEP 2143.01 entitled "Suggestion or Motivation to Modify the References" describes the legally necessary elements for establishing proper legal support for a finding of motivation to modify references. A portion thereof is copied below:

In determining the propriety of the Patent Office case for obviousness in the first instance, it is necessary to ascertain whether or not the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art having the reference before him to make the proposed substitution, combination, or other modification." In re Linter, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972).

*Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art.* "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

Regarding Applicants' recited nanoporosity of the claimed nanoparticles, the Examiner does not identify a teaching or suggestion to combine Meyer and Garg, but instead relies on the motivation to add the nanoporosity disclosed in Meyer to Garg's mechanical polishing slurry simply "because such compounds can be used in polishing agents".

However, the case law summarized below is clear that simply the ability to combine, without "*some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art*" is not sufficient to make out a *prima facie* case for obviousness.

Requirements to Establish a *Prima Facie* Case for Obviousness:

To establish *prima facie* obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. *In re Roy*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.P.A. 1974).

Requirement for a Teaching, Suggestion or Motivation to Combine References:

*When an obviousness determination is based on multiple prior art references, there must be a showing of some "teaching, suggestion, or reason" to combine the references.*

*Gambro Lundia AB v. Baxter Healthcare Corp.*, 110 F.3d 1573, 1579, 42 USPQ2d 1378, 1383 (Fed. Cir. 1997) (also noting that the "absence of such a suggestion to combine is dispositive in an obviousness determination"). Whether motivation to combine the references was shown we hold a question of fact. *See In re Dembiczak*, 175 F.3d 994, 1000, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999) ("[P]articular factual findings regarding the suggestion, teaching, or motivation to combine serve a number of important purposes . . .") (emphasis added); *Monarch Knitting*, 139 F.3d at 881-83, 886, 45 USPQ2d at 1982, 1983 (treating motivation to combine issue as part of the scope and content of the prior art and holding that genuine issues of fact existed as to whether one of ordinary skill in the art would have been motivated to combine the references in question).

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention when there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 2221 U.S.P.Q. 929, 933 (C.A.F.C. 1984).

There is no evidence provided by the Examiner relating to the required *motivation to combine Meyer and Garg either explicitly, implicitly, or in the knowledge generally available to one of ordinary skill in the art*. The single mention in Meyer that nanoporous particles can be used in polishing, without the recognition of any advantages thereof, does not provide the required "teaching, suggestion, or motivation" to modify that must be "found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. Without the benefit of Applicants' application one having ordinary skill in the art would not specifically recognize the advantages of the recited nanoporosity for CMP described in Applicants' application which have unexpectedly found to provide improved CMP results.

Moreover, as noted above, one having ordinary skill in the art of polishing would realize Garg teaches away from nanoporosity for slurry particles since one having ordinary skill in the art of mechanical polishing would recognize that porosity of any kind would mechanically weaken the particles and make them susceptible to fracture or even pulverization. Accordingly, absent impermissible hindsight regarding Applicants' findings, one having ordinary skill in the art would not recognize a single advantage of nanoporosity for particles as described and claimed by Applicants.

Moreover, Applicants have copied MPEP 2141.01(a) below to emphasize that Garg and Meyer are *non-analogous art* relative to CMP slurry art for which the present inventors were concerned.

#### **2141.01(a) Analogous and Nonanalogous Art**

TO RELY ON A REFERENCE UNDER 35 U.S.C. 103, IT MUST BE ANALOGOUS PRIOR ART

The Examiner must determine what is "analogous prior art" for the purpose of analyzing the obviousness of the subject matter at issue. "In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." In re Oetiker, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992). See also In re Deminski, 796 F.2d 436, 230 USPQ 313 (Fed. Cir. 1986); In re Clay, 966 F.2d 656, 659, 23 USPQ2d 1058, 1060-61 (Fed. Cir. 1992) ("A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem."); and Wang Laboratories Inc. v. Toshiba Corp., 993 F.2d 858, 26 USPQ2d 1767 (Fed. Cir. 1993).

Applying the above rule, Applicants' field of endeavor is CMP slurries, which involves chemical and mechanical action, the problem at hand is reducing surface defectivity, which translates into yield loss for integrated circuits. Garg's mechanical slurry is not reasonably

pertinent to the particular problem with which the inventor was concerned, that being reducing surface defectivity in CMP processing. Meyer is not reasonably pertinent to the problem at hand, as Meyer does not relate to slurries for polishing at all. Accordingly, Applicants submit that one both Garg and Meyer are nonanalogous to Applicants' claimed CMP slurry.

Accordingly, it cannot be obvious to modify Garg's mechanical slurry to add the nanoporosity allegedly disclosed by Meyer since (i) there is no teaching, suggestion or legally sufficient motivation provided to combine Meyer's nanoporosity to Garg's slurry, (ii) Garg and Meyer teach away from one another on several grounds, and (iii) both Garg and Meyer are non-analogous art to Applicants' CMP. On this basis alone, without relying on the claimed CMP additive, Applicants submit the amended independent claims 1 and 73 and all claims dependent thereon are patentable over the cited art.

Moreover, the claimed slurry additive adds another nonobvious feature, that being the claimed additive. Although the Examiner asserts:

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Garg in view of Meyer by employing an oxidizer, and additives such as salts and surfactants, as taught by Kaufman for the purpose of respectively aiding in oxidizing and polishing metals (Kaufman, column 5, lines 39-51), improving or enhancing the polishing rate of barrier layers in the wafers (Kaufman, column 6, line 65 –column 7, line 2), and reducing the within-wafer-in-uniformity of the wafers, thereby improving the surface of the wafer and reducing wafer defects (Kaufman, column 7, lines 15-19).

Kaufman relates to CMP which is performed on wafers, such as silicon wafers to make complex integrated circuits, where the CMP process is concerned with oxidizing and polishing metals, polishing barrier layers, reducing within-wafer uniformity, and reducing defects. Garg's mechanical polishing process is disclosed in a patent dealing with a ceramic raw material, and has nothing to do with integrated circuits. Garg does not disclose or suggest how to use the slurry, but given that Garg's field of endeavor is nanoparticles for ceramics not wafer processing, Garg must be considered unrelated to oxidizing and polishing metals, polishing barrier layers, increasing within-wafer uniformity, and reducing wafer defects. Accordingly, it cannot be obvious to add Kaufman's CMP additives to Garg's mechanical slurry because obviousness can only be established by combining or modifying the teachings of the prior art (Garg) to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. Accordingly, the claimed slurry additive adds another inventive step evidencing limitation to independent claim 1.

Moreover, there would also be no motivation to combine porous particles with Kaufman. As indicated by the Office Action, Kaufman is aimed at improving or enhancing the polishing rate of barrier layers. Using a porous particle reduces the polishing rate, by making the particle "softer." Surprisingly, the nanoporosity results in significantly reduced surface defectivity, which is a critical characteristic of the claimed invention.

Claim 73 recites "A slurry for chemical mechanical polishing (CMP), comprising: a bulk solution, said bulk solution being in a pH range of 1 to 6 or 8 to 13, and a plurality of nanoporous comprising particles". The pH, like Applicants slurry additives recited in amended claim 1, are

specific to CMP. In contrast, mechanical polishing slurries are essentially neutral (pH of 7). Accordingly, for reasons analogous to those described above relative to amended claim 1, claim 73 and its dependent claim are believed to be unobvious and thus patentable over the cited art.

Some dependent claims are believed to provide separate bases for patentability. For example, claim 2 recites "The slurry of claim 1, wherein said additive comprises said selective adsorption additive," such as a surfactant or surface active polymer. As taught in the present application, the claimed nanoporous slurry particles provide unexpected and highly advantageous results, particularly when used in conjunction with Applicants' selective adsorption additive comprising slurry recited in claim 2. Specifically, in this arrangement, because of the porous particle surface, the adsorption of surfactants or polymer additives can occur at different, and generally lower, concentrations as compared to bulk particles.

Moreover, claim 6 which recites "wherein said nanosize nanoporous particles comprise nanoporous cores coated with a solid material coating or first core material coated with a second material, said second material being a nanoporous coating" appears to have been improperly rejected because no basis in the cited art for the limitation recited is provided.

Applicants also believe that new claims 75 & 76 are drawn to independently patentable subject matter. These claims are drawn to particles that comprise a material selected from a Markush group that does not include alumina. The cited references are drawn to alumina particles and neither disclose nor suggest nanoporous nanoparticles formed using the materials enumerated in this Markush group.. Accordingly, Applicants believe that claims 75 & 76 are drawn to independently patentable subject matter.

Conclusion

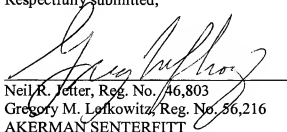
Accordingly, in view of the above, Applicants submit claim 1 which recites a slurry for chemical mechanical polishing (CMP), comprising a plurality of nanoporous comprising particles together with a bulk solution including at least one (CMP SPECIFIC) "additive selected from the group consisting of an oxidizer, a selective adsorption additive and a salt" is patentable over the cited art, as are claims dependent thereon. Similarly, claim 73 which recites a slurry for chemical mechanical polishing (CMP), comprising a plurality of nanoporous comprising particles together with a bulk solution being in a (CMP SPECIFIC) pH range of 1 to 6 or 8 to 13 is patentable over the cited art, as is its dependent claim.

Applicant hereby authorize the Commissioner to charge the fee for a two-month extension of time (\$225) to Deposit Account No. 50-0591. No additional fees are believed due; however, the Commissioner is hereby authorized to charge any deficiency or credit any surplus to Deposit Account No. 50-0591.

Applicants have made every effort to present claims which distinguish over the cited art, and it is believed that all claims are now in condition for allowance. However, Applicants request that the Examiner call the undersigned if anything further is required by the Examiner prior to issuance of a Notice of Allowance for all claims.

Respectfully submitted,

Date: January 29, 2007

  
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